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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/699,327	10/31/2003	Cameron Beccario	MSFT-2768/305786.01	2566
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VO, TED T				
ART UNIT		PAPER NUMBER		
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10/02/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary**Application No.**

10/699,327

Applicant(s)

BECCARIO ET AL.

Examiner

TED T. VO

Art Unit

2191

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 July 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. This action is in response to the amendment filed on 07/09/2008.

Claims 1-27 are amending and pending in the application.

Response to Arguments

2. This action is in response to the amendment filed on 07/09/2008. It appears Applicants' argument remarks address only for filing the amendment pursuant to 37 CFR 1.121. Thus, this action responds further to the arguments filed on 03/31/2008.

- With regards to the amendment and argument to the rejection of Claims 1-27 under 35 USC 112, 2nd paragraph: The amendment fails to make the claims clear under 35 USC 112, 2nd paragraph. See rationale address in the ground of rejection below.

- With regards to the argument remarks to the rejection of claims 1-27 under 35 USC 102(b) anticipated by the C# Language Specification, Applicants merely alleged that the prior art does not teach the claims as amended.

Examiner's response: As implied from the amendment, it appears "an undefined operator" or "an undefined operand" is merely an operator or an operand which is carried out for determining a target type. Upon such an operator or and operand, the claimed determination is used by determining as a most encompassed type, and then assigning the target type to the operator or the operand. As thus, C# Language Specification teaches such as an assignment to

an undefined operator and/or an undefined operand by determining the most encompassed type as processed in p. 98-100. The conversion in C# Language Specification meets the limitation "assigning" because the conversion is type resolution based on the type determination. The Applicants' argument does not meet the requirement in accordance to 37 CFR 1.111(b) and (c).

With regards to the argument to newly added limitation to Claims 8-9, 17-18: Applicants' argument is that C# Language Specification fails to teach parsing the expression to determine the operator.

Examiner disagrees. Parsing is a must step in any compilation. The added limitation is redundant to its preamble "In a compiler". On the other hand, C# Language Specification discloses compiling; particularly, compiling such an expression. See p. 301. More importantly, depicting the operator given in p. 107 for type resolution and conversion, it reads on the "parsing the expression" of the claims.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claims 1-7, 10-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claims are indefinite because of lacking antecedent basis

for "*said undefined operator*" in the limitation "*assigning said target type to said undefined operator*". Furthermore, implying "*said operator*" in dependent claims 2-7, 11-16 is indefinite.

5. Claims 8-9, 17-18 and 26-27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claims are indefinite because it is unclear "operator" in the claims. The claims use three different terms for operator. "an overloaded binary operator", "parsing to determine the operator", and "assigning said target type to said undefined operator". It is unclear what kind of operators recited in the claims. It appears lacking antecedent basis for operator. Furthermore, claims 8, 17, and 26 recite "all types which result from the operation of said overloaded binary operator", it lacks antecedent basis for the operation used in the claims.

6. Claims 20-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claims are indefinite because of lacking antecedent basis for "said operator" used in the claims.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-27 are rejected under 35 U.S.C. 102(b) as being anticipated by “C# Language Specification”, Version 0.28, May 2001 (hereinafter: C# Language Specification).

As per claim 1: The C# Language Specification discloses:

In a compiler, a method of determining a target type in an expression with at least one undefined operand, comprising steps of:

*determining as said target type a most encompassed type from among a first set of types, (see discussing of determination of the most encompassed type from among a set of types in sec. 6.4.2, p.98-99) where said first set of types comprises all resulting types of all first variant expressions, where each of said first variant expressions comprises said target expression with at least one of said operands, wherein at least one operand is of an undefined type, replaced using widening type conversion (See incorporation of the reference in the type conversion: Sec. 6.4, start at p. 98), *if said first set is not empty;**

if said first set is empty, determining as said target type a most encompassing type from among a second set of types (see discussing of determination of the most encompassed type from among a set of types in sec. 6.4.2, p.98-99), *where said second set of types comprises all resulting types of all second variant expressions, where each of said second variant expressions comprises said target expression with at least one of said operands, wherein at least one operand is of an undefined type, replaced using at least one of widening and narrowing type conversion* (See incorporation of the reference in the type conversion: Sec. 6.4, start at p. 98); *and*

The above claim is anticipated by rules set for in the C# programming specification.

See p. 98-100, For "*determining*", see the definitions for most encompassed types among set of type A, and most encompassing type among set of type B (p. 99, the seventh ??, eighth ?? and ninth ??); and the discussions of user-defined implicit conversions and user-defined explicit conversions. These definitions/discussions have the means for determining a type as a most encompassed type from among a set of types and the means for determining a type as a most encompassing type from among a set of types. These are incorporated in the teachings disclosed in p. 107.

See p. 107: in sec. 7.2.4, where the set of candidate user-defined operator (*first set*) provided by X and Y ("*operand replace using widening type conversion*" reads on union, provided by of X and provided by Y), and see in 7.2.4, first ?? : using rules 7.2.5, or see second ?? : If this set is not empty, then..., : "*determining as said target type a most encompassed type from among a first set of types*". Also see in the second ?? and third ?? : 'Otherwise, the predefined operator op implementations (*second set*) become the set of candidate operators for the operation ', and the

acts thereafter: “*determining as said target type a most encompassing type from among a second set of types..*”. Variables such as x, or y in the expressions: *variant expressions*.

assigning said target type to said undefined operator (i.e. a candidate operator that results from determinations).

As per claim 2: Claims 2 recite the functionality of claim 1 in determining the first set of types, but further defining operands that comprising n operands where each operand O_m is a specific type T_m .

See the rationale in Claims 1, and see the section 7.2.4, it discusses at least operand x in the set X or y in the set Y for user-defined operators. Assume that X is not empty and has more than one element. For example, n elements

As per claim 3: Claims 3 recite the functionality of claim 1 in determining the second set of types, but further defining hypothetical operands that comprising n operands ($n+1$ to $n+n$) where each operand HO_{n+m} is a specific type T_m . With regards to the limitation recited in Claim 3, see the rationale in Claims 1, and see the section 7.2.4, it discusses at least operands list (x,y) that became result of overload resolution process.

As per claim 4: Claim 4 recites the converting the operands and computing which read on the conversion process of types in the reference.

As per claims 5-7: The limitations recited in the claims are intended uses, i.e. the limitations are included without being functioned in the claims. Thus, see operands/operators/type in the reference for disclosing these claims.

As per Claims 10-16: See rationale addressed above for Claims 1-7.

As per Claims 19-25: See rationale addressed above for Claims 1-7.

As per Claim 8: C# Language Specification discloses:

In a compiler, a method of resolving an expression comprising an overloaded binary operator (See table in p. 105: included with binary operators), *a first operand of a first type and a second operand of a second type* (See depicted operation $x \text{ op } y$: x may be an operand of first type, and y may be operand of a second type (an example in the last 3-lines in p. 107 to an operation such as $b * s$, where b is a byte and s is short, etc)), *comprising steps of:*

parsing the expression to determine the operator, the first operand and the second operand, wherein at least one of the set comprising the first operand and the second operand is of an undefined type (See all sections of 7.2.6, start at p. 107);

determining a first set of types, where said first set comprises all types to which there is a widening conversion from said first type; (depict an example of $b * s$, the first set may be includes widening conversion members of all byte types, such as “int” – See sec. 6, for “conversion” and see using the set of type A or type B)

determining a second set of types, where said second set comprises all types to which there is a widening conversion from said second type (depict an example of $b * s$, the second set may be includes widening conversion members of all short type, such as “int” - See sec. 6, for “conversion” and see using the set of type A or type B)

There are many sets of types in the reference, for example, see sec. 6.4.2. For example set of type A or type B, type S, type X, and T, etc.

determining a third set of types, where said third set comprises all types which result from the operation of said overloaded binary operator on a type from among said first set and a type from among said second set;

See each determination of Conversions in sec 6, where the third set of types meets all conditions of a depicting type: For example(p.96: lines:1-4): If a set of type is char then result sets are sbyte, byte, or short – i.e. all the result types in a standard conversion to a target type (in p. 99)). And then see sec. 7.2.4, start at p. 107, a generic candidate binary operation $op(x, y)$ of a user defined operator, the third set is the set of result types in overload resolution process, where it is incorporated from the result types for the types in X and the types in Y as discussed in sec.6.

if said third set of types is empty, determining a fourth set of types, where said fourth set comprises all types to which there is a narrowing conversion from said first type and all types to which there is a widening conversion from said first type;

i.e. the result types of x in X and of y in Y do not contain a type for both (similarly to the example of $b * s$, the result type is not empty), then the fourth set reads on the result types for x in X, with respect to user candidate binary operator of sec. 7.2.4, as it is incorporated to sec .6 for type conversion.

if said third set of types is empty, determining a fifth set of types, where said fifth set comprises all types to which there is a narrowing conversion from said second type and all types to which there is a widening conversion from said second type;

i.e. the result types of x in X and of y in Y do not contain a type for both; then the fifth set reads on the result types for y in Y, with respect to user candidate binary operator of sec. 7.2.4, as it is incorporated to sec .6 for type conversion.

if said third set of types is empty, determining a sixth set of types, where said sixth set comprises all types which result from the operation of said overloaded binary operator on a type from among said fourth set and a type from among said fifth set;

i.e. the union of result types of x,y under the type overload in sec. 7.2.4, as it is incorporated to sec .6 for type conversion.

if said third set of types is not empty, selecting the most encompassed type in said third set as a target type; See sec 6, for determining the most encompassed type;

if said third set of types is empty, selecting the most encompassing type in said sixth set of types as said target type See sec 6, for determining the most encompassing type; *and*

assigning said target type to said undefined operator (i.e. type conversion for a binary operator in the overload resolution).

As per Claim 9: C# Language Specification discloses,

converting said first operand to said target type;

converting said second operand to said target type;

computing said operation on said converted first operand and said converted second operand. See overload resolution process as discussed, start from sec. 7.2.4, and its incorporation of sec. 6.

As per Claims 17-18: Refer to the rationale as addressed top Claims 10-16.

Claims 26-27: Claims 26-27 is merely manipulating a mathematic algorithm.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ted T. Vo whose telephone number is (571) 272-3706. The examiner can normally be reached on 8:00AM to 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wei Y. Zhen can be reached on (571) 272-3708.

The facsimile number for the organization where this application or proceeding is assigned is the Central Facsimile number **571-273-8300**.

Any inquiry of a general nature or relating to the status of this application should be directed to the TC 2100 Group receptionist: 571-272-2100. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TTV
September 22, 2008

/Ted T. Vo/
Primary Examiner, Art Unit 2191